

Appl. No. 10/606,108
Reply to Office Action of August 28, 2007
Amdt. Dated April 14, 2008

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-20 (Canceled).

21. (Previously Presented) A magnetic head assembly for a helical scan drive comprising:

a magnetic recording head, having a leading side and a trailing side relative to the traveling direction of a magnetic recording medium and fabricated in a thin film forming process, at least one auxiliary member adhered to either said leading side or said trailing side of said magnetic recording head, said magnetic recording head mounted in a helical scan drive and including:

a substrate,

a first magnetic core formed above said substrate and having a substantially rectangular-shaped front end face,

a second magnetic core formed above said substrate and having a front portion, a substantially rectangular-shaped front end face, and a back portion, said back portion being connected to said first magnetic core,

a magnetic gap of predetermined thickness provided between said front end face of said first magnetic core and said front end face of said second magnetic core,

a planar spiral coil having a portion thereof disposed between said first magnetic core and said second magnetic core for developing a magnetic flux between the first and second magnetic cores,

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wherein a width of said second magnetic core front end face is smaller than a width of said first magnetic core front end face; and

wherein the first magnetic core and the second magnetic core each has a narrow region located nearest to the recording medium and a widening portion wherein the width of the cores each increases, the first magnetic core and the second magnetic core each has a widened portion that is substantially wider than the region located nearest the recording medium and which is adjacent the widening portions and the coil portion is located between the first and second magnetic cores only at the widened portions of the first and second magnetic cores, the widened portions having a generally constant width at the location of the coil portion, and further wherein the planar spiral coil is rectangular-shaped and the portion of the coil between the widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil.

22. (Previously Presented) The magnetic head assembly for a helical scan drive according to claim 21, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

23. (Currently Amended) The magnetic head assembly for a helical scan drive according to claim 21, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between the first

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and second magnetic cores, the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.

24. (Currently Amended) A magnetic head assembly for a helical scan drive comprising:

a magnetic recording head, having a leading side and a trailing side relative to the traveling direction of a magnetic recording medium and fabricated in a thin film forming process, at least one auxiliary member adhered to either said leading side or said trailing side of said magnetic recording head, said magnetic recording head mounted in a helical scan drive and including:

a substrate,

a first magnetic core formed above said substrate and having a substantially rectangular-shaped front end face,

a second magnetic core formed above said substrate and having a front portion, a substantially rectangular-shaped front end face, and a back portion, said back portion being connected to said first magnetic core,

a magnetic gap of predetermined thickness provided between said front end face of said first magnetic core and said front end face of said second magnetic core,

a planar spiral coil having a portion thereof disposed between said first magnetic core and said second magnetic core for developing a magnetic flux between the first and second magnetic cores,

wherein a width of said second magnetic core front end face is smaller than a width of said first magnetic core front end face; and

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wherein the planar spiral coil is rectangular-shaped and a portion of the coil between widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil.

25. (Previously Presented) The magnetic head assembly for a helical scan drive according to claim 24, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

26. (Currently Amended) The magnetic head assembly for a helical scan drive according to claim 24, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between the first and second magnetic cores, the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.

27. (Currently Amended) A magnetic recording system including a magnetic head assembly for a helical scan drive and a magnetic tape recording medium, the magnetic head assembly comprising:

a magnetic recording head, having a leading side and a trailing side relative to the traveling direction of the magnetic tape and fabricated in a thin film forming process, at least one auxiliary member adhered to either said leading side or said

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trailing side of said magnetic recording head, said magnetic recording head mounted in a helical scan drive and including:

a substrate,

a first magnetic core formed above said substrate and having a substantially rectangular-shaped front end face,

a second magnetic core formed above said substrate and having a front portion, a substantially rectangular-shaped front end face, and a back portion, said back portion being connected to said first magnetic core,

a magnetic gap of predetermined thickness provided between said front end face of said first magnetic core and said front end face of said second magnetic core,

a planar spiral coil having a portion thereof disposed between said first magnetic core and said second magnetic core for developing a magnetic flux between the first and second magnetic cores,

wherein a width of said second magnetic core front end face is smaller than a width of said first magnetic core front end face, and

wherein said smaller second magnetic core front end face is formed on said leading side of the magnetic recording head such that the second magnetic core front end face passes across the magnetic tape recording medium before the first magnetic core front end face; and

wherein the planar spiral coil is rectangular-shaped and a portion of the coil between widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil, the spiral coil being separated from the magnetic core portions by non-magnetic material.

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28. (Previously Presented) The magnetic recording system according to claim 27, wherein the first magnetic core and the second magnetic core each has a narrow region located nearest to the recording medium and a widening portion wherein the width of the cores each increases, the first magnetic core and the second magnetic core each has a widened portion that is substantially wider than the region located nearest the recording medium and which is adjacent the widening portions and the coil portion is located between the first and second magnetic cores only at the widened portions of the first and second magnetic cores, the widened portions having a generally constant width at the location of the coil portion, and further wherein the planar spiral coil is rectangular-shaped and the portion of the coil between the widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil.

29. (Previously Presented) The magnetic recording system according to claim 27, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

30. (Currently Amended) The magnetic recording system according to claim 27, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between the first and second magnetic cores,

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the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.

31. (Previously Presented) The magnetic recording system according to claim 28, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

32. (Currently Amended) The magnetic recording system according to claim 28, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between the first and second magnetic cores, the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.

33. (Currently Amended) A method of recording information onto a magnetic tape, the method comprising the steps of:

providing a magnetic recording head, having a leading side and a trailing side relative to the traveling direction of the magnetic tape and fabricated in a thin film forming process, at least one auxiliary member adhered to either said leading side or

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said trailing side of said magnetic recording head, said magnetic recording head mounted in a helical scan drive and including:

a substrate,

a first magnetic core formed above said substrate and having a substantially rectangular-shaped front end face,

a second magnetic core formed above said substrate and having a front portion, a substantially rectangular-shaped front end face, and a back portion, said back portion being connected to said first magnetic core,

a magnetic gap of predetermined thickness provided between said front end face of said first magnetic core and said front end face of said second magnetic core, and

a planar spiral coil having a portion thereof disposed between said first magnetic core and said second magnetic core for developing a magnetic flux between the first and second magnetic cores,

wherein a width of said second magnetic core front end face is smaller than a width of said first magnetic core front end face, and

causing the magnetic recording head to come into contact with the magnetic tape in such a manner that the second magnetic core front end face passes across the magnetic tape before the first magnetic core front end face; and

wherein the planar spiral coil is rectangular-shaped and a portion of the coil between widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil, the spiral coil being separated from the magnetic core portions by non-magnetic material.

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34. (Currently Amended) The method of recording information onto a magnetic tape according to claim 33, wherein the first magnetic core and the second magnetic core each has a narrow region located nearest to a the recording medium and a widening portion wherein the width of the cores each increases, the first magnetic core and the second magnetic core each has a widened portion that is substantially wider than the region located nearest the recording medium and which is adjacent the widening portions and the coil portion is located between the first and second magnetic cores only at the widened portions of the first and second magnetic cores, the widened portions having a generally constant width at the location of the coil portion, and further wherein the planar spiral coil is rectangular-shaped and the portion of the coil between the widened portions of the magnetic cores is at a longer side of the rectangular-shaped planar spiral coil.

35. (Previously Presented) The method of recording information onto a magnetic tape according to claim 33, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

36. (Currently Amended) The method of recording information onto a magnetic tape according to claim 33, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between

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the first and second magnetic cores, the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.

37. (Previously Presented) The method of recording information onto a magnetic tape according to claim 34, wherein said planar spiral coil and each of the first and second magnetic cores are separated by a non-magnetic film in the area between the first and second magnetic cores.

38. (Currently Amended) The method of recording information onto a magnetic tape according to claim 34, wherein a first non-magnetic film portion is provided between the substrate and the planar spiral coil outside of the area between the first and second magnetic cores, and a second non-magnetic film portion is provided between the first magnetic core and the planar spiral coil in the area between the first and second magnetic cores, the non-magnetic film portions providing a level surface for the formation of the planar spiral coil in a same plane inside and outside of the region defined by the overlap of the first and second magnetic cores.